

**Origin of Tilt Angle and Helicity in Solar
Active Region Magnetic Fields**

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ABSTRACT: It is investigated that observed property of tilt angle of magnetic polarity axis and current helicity parameter $h_{||}$ for 203 active regions, in which bipolar magnetic fields are dominant, from data set of photosphere vector magnetograms observed at Huairou Solar Observing Station of Beijing Astronomical observatory during the 22th active cycle. Some results are:

(1). It is related in sign between the tilt angle and current helicity parameter $h_{||}$ for 60% bipolar active regions, which have positive/negative tilt angles of magnetic polarity axis with negative/positive current helicity parameter $h_{||}$ in the northern/southern hemisphere, when the tilt angle and current helicity parameter are according to the regularity that others obtained before, respectively.

(2). It is correlated between variance of the tilt angles and current helicity parameters $h_{||}$ with the latitude for 138 'normal' bipolar active regions, which are accorded with Hale-Nichson Law.

(3). It is also correlated in quantity between variance of the tilt angles and current helicity parameters $h_{||}$ with the proceeding of active cycle for the 138 'normal' bipolar active regions.

Therefore, we deduce that tilt angle and current helicity are produced by Coriolis Force acting on a rising and swelling Ω flux tube in the convection zone.